DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
2001 BRAINARD ROAD
FORT HUACHUCA, ARIZONA 85613-7051

21 October 2003

IN REPLY REFER TO: Networks, Transmission and Integration Division (JTE)

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Test Certification of Nortel Networks Meridian 1 Option 51C Digital Switching System with Software Release 25.47

References:

(a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 11 January 2002

(b) CJCSI 6212.01B, "Interoperability and Supportability of National Security Systems and Information Technology Systems," 8 May 2000

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.

2. The Nortel Networks Meridian 1 Option 51C Digital Switching System with Software Release 25.47 and specified patch groups listed in enclosure 3, hereafter referred to as the system under test (SUT), meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN). JITC tested and certified the Nortel Networks Meridian 1 Option 61C, Digital Switching System with Software Release 25.47. This system is identical in software and hardware to the Meridian 1 Option 51C, the sole exception being that the Meridian 1 Option 51C houses only a single processor. JITC analysis determined the Option 51C to be functionally identical to the Option 61C for interoperability certification purposes. The identified test discrepancies shown in the Certification Testing Summary (enclosure 2) that remained open after software patches were applied and regression testing was completed have minor operational impact. The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Private Branch Exchange (PBX) 1 and PBX 2. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.

3. This finding is based on interoperability testing conducted by the JITC at the Network Engineering and Integration Laboratory, Ft. Huachuca, AZ. The Certification Testing Summary

(enclosure 2) documents the test results and describes the tested network and system configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability summary of the SUT is indicated below in table 1. The interoperability status and criticality are listed in table 2, and the Exchange Requirements (ERs) and Functional Requirements (FRs) for each network interface are listed in table 3. The Nortel Meridian 1 switch product line offers a Voice over Internet Protocol capability; however, this capability is not covered by this certification. Network Management (NM) capabilities of the SUT platform were tested in accordance with the DISA NS53 requirements as set forth in references (c) and (d). This reference requires that a switch provide NM capabilities via either Ethernet, serial (EIA-232), or serial (X.25 or BX.25 variant). This capability is not a critical requirement for a PBX1, however the SUT meets the NM requirements through the use of serial (EIA-232) connections. This interoperability test summary is based upon evaluation of:

a. The following network interfaces as specified in reference (e): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network or Commercial Network Gateway.

b. The interface and signaling requirements for trunk/line interfaces, and interoperability ERs and FRs derived from references (f) and (g).

c. The overall system interoperability performance derived from test procedures listed in reference (h).

d. Review of Letters of Compliance submitted by Nortel Networks.

Table 1. Nortel Networks Meridian 1 Option 51C Digital Switching System Interoperability Summary

Network	Critical	Status	Remarks
DSN	Yes	Certified	- Certified as a PBX1 and PBX2 - VoIP not certified - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
Commercial Network Gateway	Yes	Certified	- All critical requirements met

Legend:
DSN – Defense Switched Network
PBX – Private Branch Exchange
VoIP - Voice over Internet Protocol

Table 2. Interoperability Status

Defense Switched Network	**Trunk Interfaces**			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all critical ERs and FRs. Hotline Services[1] and Attendant Services[2] not met.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	No	Certified	Met all critical ERs and FRs. Hotline Services[1] and Attendant Services[2] not met.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Hotline Services[1] and Attendant Services[2] not met.
	Line Interfaces			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. Hotline Services[1], Attendant Services[2], and ISDN Supplemental Services not met.[3]
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Hotline Services[1], Attendant Services[2], and ISDN Supplemental Services not met.[3]
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. Hotline Services[1], Attendant Services[2], and ISDN Supplemental Services not met.[3]
	Network Management Interfaces			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	TPC EIA-232 Asynchronous @ 9.6 kbps	No	Certified	Met all critical ERs and FRs.
Commercial Network Gateway	**Trunk Interfaces**			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4

Legend:

AMI	- Alternate Mark Inversion	GSCR	- Generic Switching Center Requirements
B8ZS	- Bipolar Eight Zero Substitution	GSTP	- Generic Switch Test Plan
BRI	- Basic Rate Interface	ISDN	- Integrated Services Digital Network
CAS	- Channel Associated Signaling	kbps	- kilobits per second
DISN	- Defense Information Systems Network	Mbps	- Megabits per second
DP	- Dial Pulse	PCM-24	- Pulse Code Modulation 24 Channels
DSN	- Defense Switched Network	PRI	- Primary Rate Interface
DTMF	- Dual Tone Multi-Frequency	SF	- Superframe
EIA	- Electronic Industries Alliance	ST	- ISDN BRI Four-Wire Interface
ERs	- Exchange Requirements	SUT	- System Under Test
ESF	- Extended Superframe	T1	- Digital Transmission Link level 1 (1.544 Mbps)
FRs	- Functional Requirements	TPC	- Twisted Pair Copper
		U	- ISDN BRI Two-Wire Interface

Notes:

1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.

2 SUT does not meet the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.

3 ISDN Supplemental Services currently not used in the DISN. The operational impact is none.

4 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

Table 3. Exchange and Functional Requirements

<table>
<tr><td rowspan="11">Defense Switched Network</td><td colspan="3">Trunk Interfaces</td></tr>
<tr><td>Interface & Signaling</td><td>Critical</td><td>Exchange and Functional Requirements
(C) Critical, (NC) Not Critical</td></tr>
<tr><td>PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF</td><td>No</td><td rowspan="3">- MLPP (C)
- Hotline Services[1] (NC)
- System Interface (C)
• Non-secure Voice and Data
• Secure Voice and Data (STU-III and STE)
• NX56 kbps and NX64 kbps Synchronous Data (T1 ISDN PRI only)
• Non-secure and Secure FAX
• VTC (T1 ISDN PRI only)
• Alarms
- Integrated Services Digital Network (T1 ISDN PRI only) (C)
- Attendant Services[2] (C)
- System Administration, Measurements, and Service Standards (C)
- Y2K (Rollover, Valid, and Invalid Dates) (C)
- Screening, Zone Restriction, and DSN Access Restriction (C)
- Automated Message Accounting (C)
- Network Integration (C)
- ANSI T1.619a (T1 ISDN PRI only) (C)</td></tr>
<tr><td>PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT</td><td>No</td></tr>
<tr><td>PCM-24 T1 B8ZS/ESF ISDN PRI</td><td>Yes</td></tr>
<tr><td colspan="3">Line Interfaces</td></tr>
<tr><td>Interface & Signaling</td><td>Critical</td><td>Exchange and Functional Requirements</td></tr>
<tr><td>TPC ISDN BRI ST and U Interface Q.931</td><td>Yes</td><td>- MLPP (C)
- Hotline Services[1] (NC)
- ANSI T1.619a (C)
- ISDN Supplemental Services (NC)
- Call Treatments (NC)
- DSN Announcements (C)
- Traffic Measurements (NC)
- Attendant Services[2] (NC)
- VTC (C)
- NX56 kbps and NX64 kbps Synchronous Data (C)
- Non-secure Voice and Data (C)
- Secure Voice and Data (STE) (C)</td></tr>
<tr><td>TPC 2-Wire analog</td><td>Yes</td><td>- MLPP (C)
- Hotline Services[1] (NC)
- Call Treatments (C)
- DSN Announcements (C)
- Traffic Measurements (NC)
- Attendant Services[2] (NC)
- Non-secure Voice and Data (C)
- Non-secure and Secure FAX (C)
- Secure Voice and Data (STU-III and STE) (C)</td></tr>
<tr><td>TPC 2-Wire Digital and Analog (Proprietary)</td><td>No</td><td>- MLPP (C)
- Hotline Services[1] (NC)
- Call Treatments (C)
- DSN Announcements (C)
- Traffic Measurements (NC)
- Attendant Services[2] (NC)
- Non-secure Voice (C)</td></tr>
<tr><td colspan="3">Network Management Interfaces</td></tr>
<tr><td>Interface & Signaling</td><td>Critical</td><td>Exchange and Functional Requirements</td></tr>
<tr><td>TPC EIA-232 Asynchronous @ 9.6 kbps</td><td>No</td><td>- Automated Message Accounting (C)
- Traffic Measurements (C)
- Alarms (C)
- Man Machine Language(C)</td></tr>
</table>

Table 3. Exchange and Functional Requirements (continued)

Commercial Network Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 3.

Legend:

AMI	- Alternate Mark Inversion	MLPP	- Multi-Level Precedence and Preemption
ANSI	- American National Standards Institute	NX56	- Data format restricted to multiples of 56K
B8ZS	- Bipolar Eight Zero Substitution	NX64	- Data format restricted to multiples of 64K
BRI	- Basic Rate Interface	PCM-24	- Pulse Code Modulation 24 Channels
CAS	- Channel Associated Signaling	PRI	- Primary Rate Interface
DP	- Dial Pulse	SF	- Superframe
DSN	- Defense Switched Network	ST	- ISDN BRI Four-Wire Interface
DTMF	- Dual Tone Multi-Frequency	STE	- Secure Terminal Equipment
EIA	- Electronic Industries Alliance	STU-III	- Secure Telephone Unit-III
ESF	- Extended Superframe	SUT	- System Under Test
FAX	- Facsimile	T1	- Digital Transmission Link level 1 (1.544 Mbps)
GSCR	- Generic Switching Center Requirements	TPC	- Twisted Pair Copper
GSTP	- Generic Switch Test Plan	U	- ISDN BRI Two-Wire Interface
ISDN	- Integrated Services Digital Network	VTC	- Video Teleconferencing
kbps	- kilobits per second	Y2K	- Year 2000
Mbps	- Megabits per second		

Notes:
1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.
2 SUT does not meet all the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.
3 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

5. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (NIPRNET) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNET at https://stp.fhu.disa.mil/. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNET), or http://199.208.204.125/ (SIPRNET). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi.

6. The JITC point of contact is Mr. John Hooper, DSN 879-5041 commercial (520) 538-5041, FAX DSN 879-4347 or e-mail to hooperj@fhu.disa.mil.

FOR THE COMMANDER:

3 Enclosures:
1 Additional References
2 Certification Testing Summary
3 Meridian 1 Option 51C Software Patch Release 25.47 Patch Identification Patch List

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Chief
Networks, Transmission and Integration Division

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ADDITIONAL REFERENCES

(c) Defense Information Systems Agency (DISA) NS53, Memorandum, “DSN Switch Network Management Interface,” 26 July 2001

(d) Defense Information Systems Agency (DISA) NS53, Memorandum, “DSN Network Management Requirements for End Offices,” 2 August 2001

(e) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, “Policy for Department of Defense Voice Services,” 23 September 2001

(f) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, “Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR),” March 1997

(g) Defense Information Systems Agency (DISA) NS53, Memorandum, “DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches,” 18 March 2003

(h) Joint Interoperability Test Command, “Defense Switched Network Generic Switch Test Plan (GSTP),” 17 June 1999

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Nortel Networks Meridian 1 Option 51C Digital Switching System with Software Release 25.47 and specified Software Patch Groups listed in enclosure 3 (hereafter referred to as the system under test [SUT]).

2. PROPONENT. Defense Information Systems Agency (DISA).

3. PROGRAM MANAGER. Mr. Howard Osman, Network Services (NS) 53, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.

4. TESTERS. Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.

5. SYSTEM UNDER TEST DESCRIPTION. The Nortel Networks Meridian 1 Digital Switching System product line, in addition to the Option 51C, includes Options 61C, 81C, and 81CPP. These platforms utilize the same software and trunk/line card hardware as the SUT, with the exception that the SUT houses a single call processor. The Option 51C offers the following features: scalable, distributed platform for growth from 200 to 2000 lines, modular client/server architecture for flexibility and scalability. Nortel Network's Meridian 1 Option 51C Digital Switching System is currently in use within the Defense Switched Network (DSN) providing Private Branch Exchange (PBX) 1 switch functionality.

6. OPERATIONAL ARCHITECTURE. The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1.

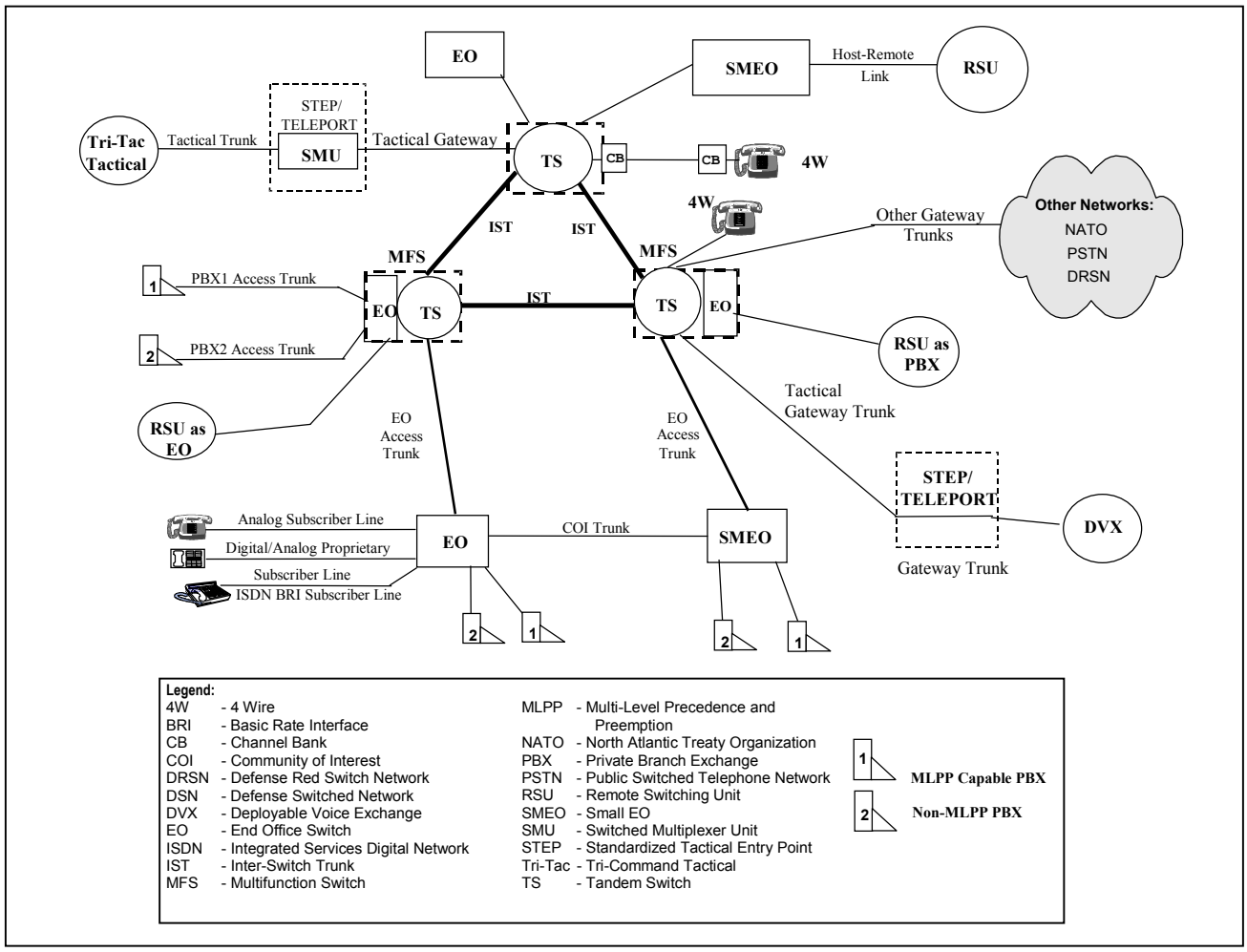


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. This interoperability test certification is based upon evaluation of the network interfaces as specified in:

a. The Chairman of the Joint Chiefs of Staff (CJCS) policy for Department of Defense voice services requirements for the DSN.

b. Interface and signaling requirements for trunk, line, and network management derived from the GSCR document, and the DISA Network Services (NS) 53, Memorandum, "DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches," dated 18 March 2003.

c. Interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from the GSCR.

The ERs and FRs for the CJCS network interfaces are indicated in table 2-1. The criticality and certification status of these interfaces can be found in paragraph 11. The test summary can be found in paragraph 11b.

Table 2-1. Exchange and Functional Requirements

<table>
<tr><td rowspan="6">Defense Switched Network</td><td colspan="3">Trunk Interfaces</td></tr>
<tr><td>Interface & Signaling</td><td>Critical</td><td>Exchange and Functional Requirements</td></tr>
<tr><td>PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF</td><td>No</td><td rowspan="3">MLPP
Hotline Services[1]
System Interface
• Non-secure Voice and Data
• Secure Voice and Data (STU-III and STE)
• NX56 kbps and NX64 kbps Synchronous Data (T1 ISDN PRI only)
• Non-secure and Secure FAX
• VTC (T1 ISDN PRI only)
• Alarms
Integrated Services Digital Network (T1 ISDN PRI only)
Attendant Services[2]
System Administration, Measurements, and Service Standards
Y2K (Rollover, Valid, and Invalid Dates)
Screening, Zone Restriction, and DSN Access Restriction
Automated Message Accounting
Network Integration
ANSI T1.619a (T1 ISDN PRI only)</td></tr>
<tr><td>PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT</td><td>No</td></tr>
<tr><td>PCM-24 T1 B8ZS/ESF ISDN PRI</td><td>Yes</td></tr>
<tr><td colspan="3">Line Interfaces</td></tr>
<tr><td>Interface & Signaling</td><td>Critical</td><td>Exchange and Functional Requirements</td></tr>
<tr><td>TPC ISDN BRI ST and U Interface Q.931</td><td>Yes</td><td>- MLPP
- Hotline Services[1]
- ANSI T1.619a
- ISDN Supplemental Services
- Call Treatments
- DSN Announcements
- Attendant Services[2]
- VTC
- NX56 kbps and NX64 kbps Synchronous Data
- Non-secure Voice and Data
- Secure Voice and Data (STE)</td></tr>
</table>

Table 2-1. Exchange and Functional Requirements (continued)

	Line Interfaces		
Defense Switched Network (continued)	**Interface & Signaling**	**Critical**	**Exchange and Functional Requirements**
	TPC 2-Wire analog	Yes	- MLPP - Hotline Services[1] - DSN Announcements - Traffic Measurements - Attendant Services[2] - Call Treatments - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE)
	TPC 2-Wire Digital and Analog (Proprietary)	No	- MLPP - Hotline Services[1] - DSN Announcements - Traffic Measurements - Attendant Services[2] - Call Treatments - Non-secure Voice
	Network Management Interfaces		
	Interface & Signaling	**Critical**	**Exchange and Functional Requirements**
	TPC EIA-232 Asynchronous @ 9.6 kbps	No	- Automated Message Accounting - Traffic Measurements - Alarms - Man Machine Language
Commercial Network Gateway	**Interface & Signaling**	**Critical**	**Exchange and Functional Requirements**
	Same Interfaces and Signaling as DSN	Yes	See note 3.

Legend:

AMI	- Alternate Mark Inversion	GSCR	- Generic Switching Center Requirements	SF	- Superframe
ANSI	- American National Standards Institute	GSTP	- Generic Switch Test Plan	ST	- ISDN BRI Four-Wire Interface
B8ZS	- Bipolar Eight Zero Substitution	ISDN	- Integrated Services Digital Network	STE	- Secure Terminal Equipment
BRI	- Basic Rate Interface	kbps	- kilobits per second	STU-III	- Secure Telephone Unit-III
CAS	- Channel Associated Signaling	Mbps	- Megabits per second	SUT	- System Under Test
DP	- Dial Pulse	MLPP	- Multi-Level Precedence and Preemption	T1	- Digital Transmission Link level 1 (1.544 Mbps)
DSN	- Defense Switched Network	NX56	- Data format restricted to multiples of 56K	TPC	- Twisted Pair Copper
DTMF	- Dual Tone Multi-Frequency	NX64	- Data format restricted to multiples of 64K	U	- ISDN BRI Two-Wire Interface
EIA	- Electronic Industries Alliance	PCM-24	- Pulse Code Modulation 24 Channels	VTC	- Video Teleconferencing
ESF	- Extended Superframe	PRI	- Primary Rate Interface	Y2K	- Year 2000
FAX	- Facsimile				

Notes:

1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.

2 SUT does not meet all the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.

3 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Network Engineering and Integration Laboratory in a manner and configuration similar to that of the DSN operational environment. This test was conducted using three test configurations shown in figures 2-2 through 2-4. Testing of the system's required functions and features was conducted using the test configuration depicted in figure 2-2, which accurately emulates the DSN operational environment. Network integration testing was conducted using the test configuration depicted in figure 2-3. Figure 2-4 depicts the test configuration used to test the Advanced Defense Switched Network Integrated Management Support System network management functions and features.

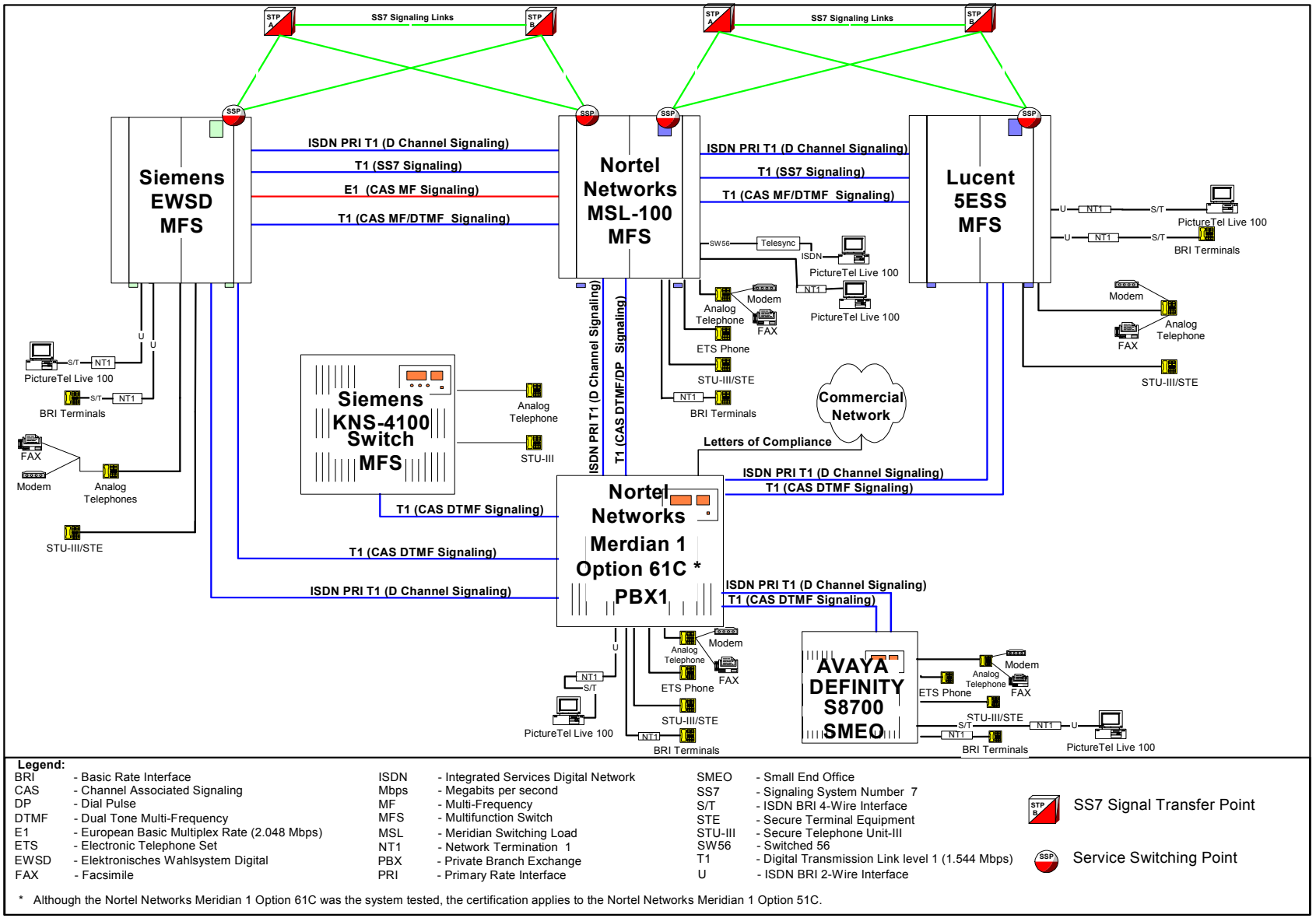


Figure 2-2. Test Configuration

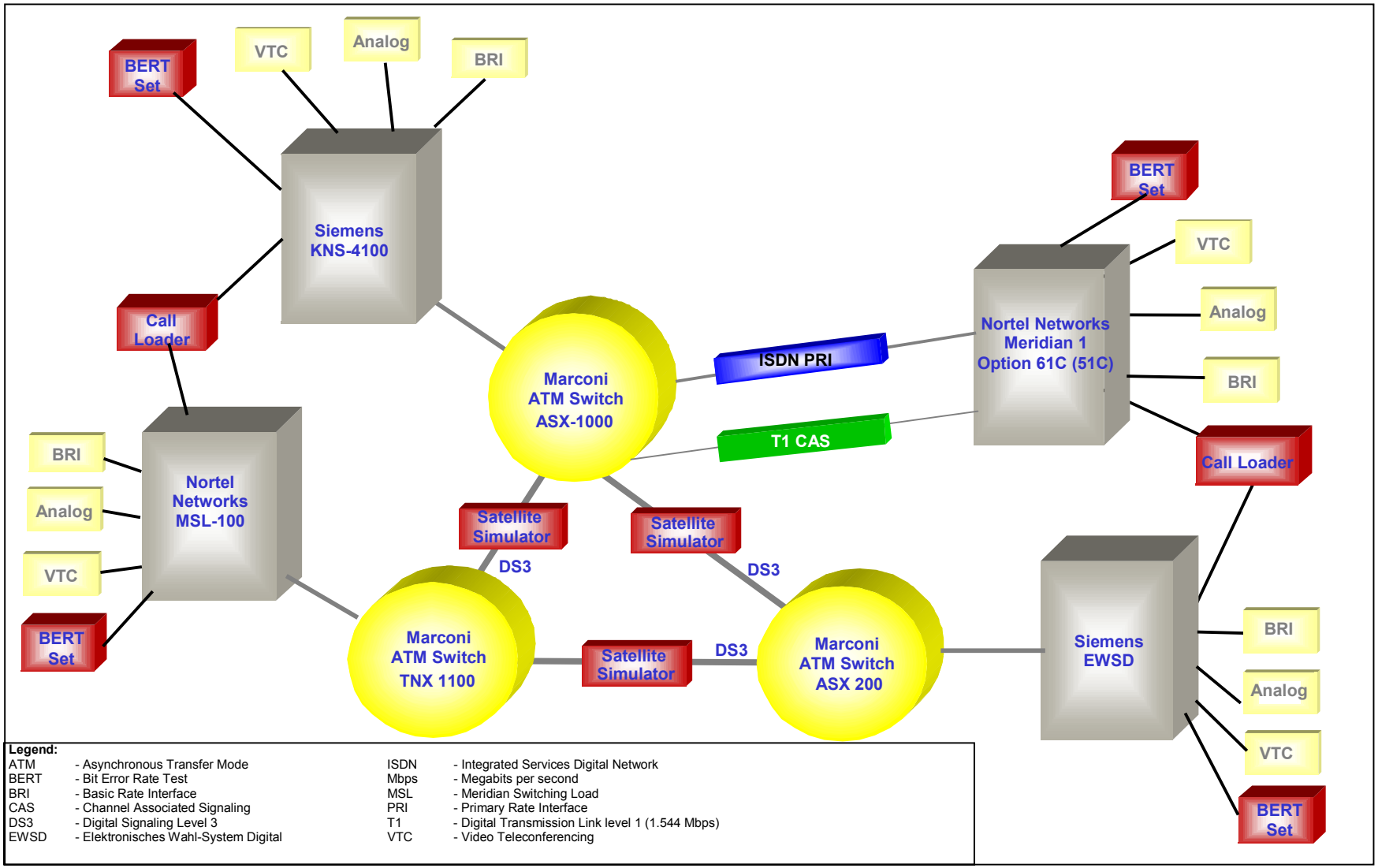
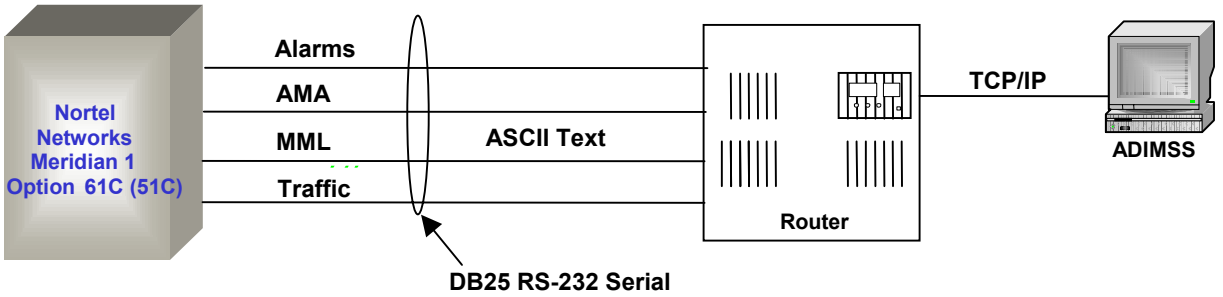


Figure 2-3. Network Integration Test Configuration



Legend:

ADIMSS	- Advanced Defense Switched Network Integrated Management Support System
Alarms	- Fault Management
AMA	- Automated Message Accounting (Accounting Management)
ASCII	- American Standard Code for Information Interchange
DB	- "D" describes the shape of the housing, "B" describes the size of the housing
DSN	- Defense Switched Network
MML	- Man Machine Language (Remote access to switch)
RS	- Recommended Standard
TCP/IP	- Transfer Control Protocol/Internet Protocol
Traffic	- Performance Management

Note:
DSN Switch Network Management Interfaces as described in reference (c) and Network Management Requirements for End Offices as described in reference (d).

Figure 2-4. Nortel Networks Meridian 1 Option 51C ADIMSS Network Management System Interface

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations used in the test.

Table 2-2. Tested System Configurations

System Name	Software Release
Nortel Networks MSL-100	MSL-17
Avaya MultiVantage S8700	R011x.7585.7.0.2
Nortel Networks Meridian 1 Option 61C (51C)	25.47
Siemens EWSD	19d with Patch Set 39
Siemens KNS-4100	APS4V2.3
Lucent Technologies 5ESS	5E16.2
SMU 96 Tactical Gateway	RD302185
Tekelec STP	23.1
Nortel Networks Broad Band STP	3.0.3.18d
DSS Red Switch	8.03
MARCONI ATM switches	Versions 6.2 and 7.1

Legend:
ATM - Asynchronous Transfer Mode
DSS - Digital Small Switch
EWSD - Elektronisches Wahlsystem Digital
MSL - Meridian Switching Load
SMU - Switch Multiplexer Unit
STP - Signal Transfer Point

10. TESTING LIMITATIONS. The Nortel Networks Meridian 1 Option 61C Digital Switching System was the only switch platform tested by JITC; however, the test results are applicable to the Option 51C. The Nortel Networks Meridian 1 Option 51C Digital Switching System employs the same software and hardware as the Option 61C with the exception that the Option 51C houses a single processor. As a result the Option 51C only meets the availability and reliability requirements for a PBX1 and not for a Small End Office. JITC analysis determined it to be functionally identical for certification purposes.

11. TEST RESULTS. Tables 2-3 through 2-6 synopsize the SUT interface ER and FR status and criticality. The identified test discrepancies shown below remained open after software patches were applied and regression testing was completed; they have an overall minor operational impact. A detailed description of these discrepancies can be found in paragraph 11a.

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DTMF	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met[1]
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met[2]
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	No	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DP IN/DTMF OUT	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met[1]
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met[2]
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	No	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CCS (B8ZS/ESF) ISDN PRI	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met[1]
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		ISDN	No	II-6.2	6.6, 21.1, 21.2, 21.3	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met[2]
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	No	Met
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Legend:

AMA	- Automated Message Accounting	ER	- Exchange Requirements	PCM-24	- Pulse Code Modulation 24 channels
AMI	- Alternate Mark Inversion	ESF	- Extended Superframe	PRI	- Primary Rate Interface
ANSI	- American National Standards Institute	FAX	- Facsimile	SF	- Superframe
B8ZS	- Bipolar Eight Zero Substitution	FR	- Functional Requirements	SUT	- System Under Test
CAS	- Channel Associated Signaling	GSCR	- Generic Switching Center Requirements	T1	- Digital Transmission Link level 1 (1.544 Mbps)
CCS	- Common Channel Signaling	GSTP	- Generic Switch Test Plan	VTC	- Video Teleconferencing
DP	- Dial Pulse	ISDN	- Integrated Services Digital Network	Y2K	- Year 2000
DSN	- Defense Switched Network	Mbps	- Megabits per second		
DTMF	- Dual Tone Multi-Frequency	MLPP	- Multi-Level Precedence and Preemption		

Notes:

1 SUT does not meet all the GSCR exchange requirements for hotline services. This is not a critical requirement.

2 SUT does not meet all the GSCR exchange requirements for attendant services. This is not a critical requirement.

Table 2-4. Defense Switched Network Line Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
TPC, ISDN BRI ST and U, Q.931	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met[1]
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met
		ISDN Supplemental Services	Yes	II-6.2	21.3	No	Not Met[3]
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met[2]
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	No	II-19.2	5.6	Yes	Met
TPC, 2 Wire Analog	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met[1]
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met[2]
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	No	II-19.2	5.6	Yes	Met

Table 2-4. Defense Switched Network Line Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
TPC 2 Wire Digital (Proprietary)	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	No	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met[1]
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met[2]
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	No	Met
		DSN Announcements	No	II-19.2	5.6	No	Met

Legend:
ANSI - American National Standards Institute
BRI - Basic Rate Interface
DSN - Defense Switched Network
DISN - Defense Information Systems Network
ER - Exchange Requirements
FR - Functional Requirements
GSCR - Generic Switching Center Requirements
GSTP - Generic Switch Test Plan
ISDN - Integrated Services Digital Network
MLPP - Multi-Level Precedence and Preemption
ST - ISDN BRI 4-Wire Interface
SUT - System Under Test
TPC - Twisted Pair Copper
U - ISDN BRI 2-Wire Interface

Notes:
1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.
2 The does not meet the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.
3 ISDN Supplemental Services currently not used in the DISN. The operational impact is minor.

Table 2-5. Defense Switched Network Network Management Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
TPC EIA-232 Asynchronous @ 9.6 kpbs	Certified	AMA	No	II-23.2	2.1.10, 16.1	No	Met
		Traffic Measurements	No	II-23.2	2.1.10, 16.1	No	Met
		MML	No	II-23.2	2.1.10, 16.1	No	Met
		Alarms	No	II-23.2	2.1.10, 16.1	No	Met

Legend:

AMA - Automated Message Accounting
EIA - Electronic Industries Alliance
ER - Exchange Requirements
FR - Functional Requirements
GSCR - Generic Switching Center Requirements
GSTP - Generic Switch Test Plan
kbps - kilobits per second
MML - Man Machine Language
TPC - Twisted Pair Copper

Table 2-6. Commercial Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
Same Interfaces Signaling as DSN	Certified	See Note	No	See Note	See Note	Yes	Met

Legend:
DSN - Defense Switched Network
ER - Exchange Requirements
FR - Functional Requirements
GSCR - Generic Switching Center Requirements
GSTP - Generic Switch Test Plan
Note: The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

a. Discussion

(1) DSN. All critical interface ERs and FRs for DSN were met. The following minor exceptions are noted:

(a) The SUT attendant console does not meet the following GSCR requirements:

- Transfer of a line or trunk call at a precedence above ROUTINE. GSCR Para. 2.1.3.3
- Display of precedence or class of service. GSCR Para. 2.1.3.2
- Queuing by order of precedence (highest first). GSCR Para. 2.1.3.1

The SUT Attendant console is not certified. This is not a critical requirement for a PBX1 and its operational impact is minor.

(b) The SUT does not support route digit 5 or 6 for Hotline Services. This is not a critical requirement for a PBX1 and its operational impact is minor.

(c) The SUT does not support the following unique Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) Supplemental Services as specified in the respective GSCR paragraphs listed below. There are currently no switches in the DISN that support ISDN BRI Supplemental Services. The operational impact is minor.

- Conference Calling. GSCR Para. 21.3.2
- User-to-User Signaling. GSCR Para. 21.3.3
- Call Hold. GSCR Para. 21.3.4
- Call Waiting. GSCR Para. 21.3.5
- Normal Call Transfer. GSCR Para. 21.3.6
- Explicit Call Transfer. GSCR Para. 21.3.7
- ISDN Call Deflection. GSCR Para. 21.3.8
- Preset Conference Calling. GSCR Para. 21.3.11

(2) Commercial Network Gateway. The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP, specified in tables 2-1 through 2-15 of the GSCR, with minor exceptions. Exceptions were reviewed and assessed by DISA NS53, the Development and Operational Engineering Department, and determined to have a minor operational impact.

b. Test Summary. The Nortel Networks Meridian 1 Option 51C Digital Switching System with its associated software releases listed in table 1 of the memo, is certified for joint use in the DSN, in accordance with the requirements set forth in the GSCR. Minor discrepancies identified during testing and the GSCR requirements not tested will have no adverse operational impact. The interoperability summary and status to include criticality for each interface is shown in tables 2-7 and 2-8.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed per the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (NIPRNET) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNET at https://stp.fhu.disa.mil/. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNET), or http://199.208.204.125/ (SIPRNET). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi.

Table 2-7. Nortel Networks Meridian 1 Option 51C Digital Switching System Interoperability Summary

Network	Status	Remarks
DSN	Certified	- Certified as a PBX1 and PBX2 - VoIP not Certified - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
Commercial Network Gateway	Certified	- All critical requirements met

Legend:
DSN - Defense Switched Network
PBX - Private Branch Exchange
VoIP - Voice over Internet Protocol

Table 2-8. Interoperability Status

Defense Switched Network	**Trunk Interfaces**			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all critical ERs and FRs. Hotline services[1] and Attendant Services[2] not met.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	No	Certified	Met all critical ERs and FRs. Hotline services[1] and Attendant Services[2] not met.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Hotline services[1] and Attendant Services[2] not met.
	Line Interfaces			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. Hotline services[1], Attendant Services[2], and ISDN Supplemental Services[3] were not met. Operational impact is minor.
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Hotline services[1] and Attendant Services[2] not met.
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. Hotline services[1] and Attendant Services[2] not met.
	Network Management Interfaces			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	TPC EIA-232 Asynchronous @ 9.6 kbps	No	Certified	Met all critical ERs and FRs.

Table 2-8. Interoperability Status (continued)

Commercial Network Gateway	Trunk Interfaces			
	Interface & Signaling	**Critical**	**Status**	**Remarks**
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4.

Legend:

AMI	- Alternate Mark Inversion	GSTP	- Generic Switch Test Plan
B8ZS	- Bipolar Eight Zero Substitution	ISDN	- Integrated Services Digital Network
BRI	- Basic Rate Interface	kbps	- kilobits per second
CAS	- Channel Associated Signaling	Mbps	- Megabits per second
DP	- Dial Pulse	NATO	- North Atlantic Treaty Organization
DISN	- Defense Information Systems Network	PCM-24	- Pulse Code Modulation 24 Channels
DSN	- Defense Switched Network	PRI	- Primary Rate Interface
DTMF	- Dual Tone Multi-Frequency	SF	- Superframe
EIA	- Electronic Industries Alliance	ST	- ISDN BRI Four-Wire Interface
ERs	- Exchange Requirements	SUT	- System Under Test
ESF	- Extended Superframe	T1	- Digital Transmission Link level 1 (1.544 Mbps)
FRs	- Functional Requirements	TPC	- Twisted Pair Copper
GSCR	- Generic Switching Center Requirements	U	- ISDN BRI Two-Wire Interface

Notes:

1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.

2 The does not meet the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.

3 ISDN Supplemental Services currently not used in the DISN. The operational impact is none.

4 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

Meridian 1 Option 51C Software Release 25.47 Patch Identification
Patch List

CORE Software Patch List		
Patch ID Number	**PRS Number**	**Description**
MPLR16260	MP17717	INI CODE ID (INI000 0000001D) FROM DCH_HANDLER PROCEDURE
MPLR16674	Q004828	DSN: Precedence calls to a Hunt Group do not get proper treatment
MPLR16789	Q436716	Four Issues: 1. T1 CAS Intermittent Preempt Wink. 2. Bug105. 3. ANSI T1.619A PRI Preempt for Re-use Unanswered. 4. AMA: Data: Outgoing (cause 9) - Timing Issue
MPLR16790	Q005260	SLPREM - Preemption: 1. Origination Busy Treatment. FFC code. 2. Busy Non-preemptable station trunk Preemption Cause 46. 3. T1 PRI Non-preemptable station Busy Not Equipped Announcement (BNEA).
MPLR16798	Q005385	DSN: No DMI Digit Manipulation after glare failure.
MPLR16801	Q005259	DSN: The M1 Option 61C switch does not provide the correct response to a failed wink start condition.
MPLR16806	Q005259	DSN: Outgoing Preempt Not For Reuse Answered Trailing Digit.
MPLR16857	Q005423	DSN: Outgoing trunk preemption fails over NI-2
MPLR16878	Q005193	DSN: Call Transfer 2nd leg sends originators precedence level.
MPLR16879	Q005194	DSN: Conference Call not preserving precedence level.
MPLR16912	Q005571	DSN: Different Service Domains via T1 CAS allow preemption
MPLR16926	Q005592	Change BSERV on NI2 causes system to INI.
MPLR16937	Q005626	DSN: Changing MLSD in LD 87 causes other fields to change.
MPLR16939	Q005571	DSN: BRI sets with different Service Domains allow preemption
MPLR16945	Q005629	NI2: Bearer channel disable/enable fails with SL-100/Siemens
MPLR17308	Q006365	Euro-ISDN STE mu-law to A-law conversion over E1 PRI
MLPR17473	Q001747	The IGF and OGF timers for preemption calls on T1 CAS needs the minimum threshold to be lowered.
MLPR17344	Q005871	ATVN trunks on TMDI card behave differently from tie trunks - channel status mismatch between M1 and SL100 when the loop is enabled.
MLPR17582	Q005965	DSN: Unable to send B-Channel status message from individual channels.
MLPR17502	Q005871	Channel status mismatch after Yellow Alarm cleared.
LOADWARE Software Patch List		
Patch ID Number	**PRS Number**	**Description**
MPLR17079	Q005959	X11 25.47 psdl file NI02 version 23 fails to download
MLPR17395	Q005965	NI2 remote busy-out

Legend:

AMA - Automated Message Accounting
ANSI - American National Standards Institute
ATVN - Autovon
BRI - Basic Rate Interface
BSERV - Bearer Service
CAS - Channel Associated Signaling
DCH - Data Channel
DMI - Digit Manipulation Index
DSN - Defense Switched Network
E1 - European Basic Rate (2.048 Mbps)
FFC - Flexible Feature Code
ID - Identification
IGF - Incoming Flash Timer
INI - Initialize
ISDN - Integrated Services Digital Network
LD - Overlay
Mbps - Megabits per second
MLPP - Multi-Level Precedence and Preemption
MLSD - MLPP Service Domain
NI2 - National ISDN-2
OGF - Outgoing Flash Timer
PRI - Primary Rate Interface
PRS - Patch Report System
SLPREM - Station Loop Preemption
STE - Secure Terminal Equipment
T1 - Digital Transmission Link Level 1 (1.544 Mbps)
TMDI - Time Multiplexer Digital Interface